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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

KIM, KEVIN

ART UNIT PAPER NUMBER

2634

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/901,323

Applicant(s)

KRUPKA, EYAL

Examiner

Kevin Y Kim

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,6,7,13,17,20-23 is/are rejected.
- 7) ☒ Claim(s) 2-5,8-12,14-16,18,19,24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 6, 7, 13, 17, 20, 21, and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishizu et al (US 5,475,710).

Claims 1, 13 and 17.

Ishizu et al discloses a communication apparatus (see Fig.1), comprising:

- a) means for obtaining channel taps associated with a communication channel, see col. 43, lines 9-10 describing the initialization of tap coefficients of a filter for a communication channel;
- b) means for determining a channel taps covariance matrix for said communication channel using said channel taps, see col. 43, line 9-10 describing the initialization of a tap coefficient error covariance matrix, which apparently requires the knowledge of the tap coefficients, and;
- c) means for updating the channel taps using the channel taps covariance matrix, see col. 43, line 11-14, describing the updating of the tap coefficients using the tap coefficients error covariance.

Claim 6.

Ishizu et al discloses a communication apparatus (see Fig.1), comprising:

- a) an equalizer (1) including at least one input to receive channel taps for configuring the equalizer, see the inputs to the multipliers,
- b) a channel tracking unit (5) to update the channel taps based on the output of the equalizer and a covariance matrix associated with the channel taps, see col. 43, line 11-14, describing the updating of the tap coefficients using the tap coefficient error covariance matrix.

Claim 7.

Ishizu et al teaches a covariance matrix estimator, see col. 43, line 9-10 describing a means for initializing a tap coefficient error covariance matrix.

Claim 20.

Ishizu et al discloses a communication apparatus (see Fig.1), comprising:

- a) an equalizer (1) including at least one input to receive channel taps for configuring the equalizer, see the inputs to the multipliers and note that all equalizers having “a transfer function that depends upon a plurality of channel taps;”
- b) a channel estimator (5) to determine initial channel taps for the communication channel, see col. 43, lines 9-10 describing the initialization of tap coefficients of a filter
- c) a channel tracking unit (5) to track the plurality of channel taps over time, including

i) a covariance matrix estimator to estimate a covariance matrix associated with the plurality of channel taps, see col. 43, line 9-10 describing the initialization of a tap coefficient error covariance matrix, which must use the tap coefficients of the channel

ii) an update unit to update the channel taps based on the covariance, see col. 43, line 11-14, describing the updating of the tap coefficients using the tap coefficients error covariance.

Claim 21.

Ishizu et al discloses the channel estimator (5) that determines the initial channel taps using training sequence received from the communication channel, having a priori knowledge of the training sequence. See training sequence generator (22) coupled to the channel estimator (5).

Claim 23.

Ishizu et al discloses the covariance matrix estimator to estimate an initial covariance matrix based on an output of the channel estimator, see col. 43, line 9-10 describing the initialization of a tap coefficient error covariance matrix, which must use the tap coefficients of the channel.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizu et al as applied to claim 20 above in view of Gu et al (US 6,421,380).

Ishizu et al discloses all the subject matter claimed, as explained above, but is silent on a technique to use for the initialization of the tap coefficients, whereas the claimed invention specifically requires the use of "a least squares" technique. However, a least mean square (LMS) algorithm is a most commonly used algorithm for tap coefficients in the art as evidenced by Gu et al, see col. 2, lines 46-51, and thus would have been obvious used for the tap coefficients initialization of Ishizu et al.

Allowable Subject Matter

5. Claims 2-5, 8-12, 14-16, 18, 19 and 24 are objected as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Lam, Lin

KEVIN KIM
PATENT EXAMINER